

CLAIMS

What is claimed is:

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1. An ultra-narrow band fluorine laser apparatus comprising a laser chamber which is filled with a laser gas including fluorine and to which a predetermined discharge voltage is applied between a cathode and an anode thereof for causing a fluorine laser to oscillate laser light to be supplied as an exposure light source of an exposure apparatus, wherein the pressure of said laser gas is set equal to or lower than a predetermined value such that a bandwidth of laser light oscillated by said laser chamber is narrowed to a desired value.

2. An ultra-narrow band fluorine laser apparatus according to Claim 1, wherein said bandwidth is narrowed to a desired value within the range from 0.2 to 0.3 pm.

3. An ultra-narrow band fluorine laser apparatus according to Claim 1, wherein the pressure of said laser gas is set equal to or lower than 1 atm.

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4. An ultra-narrow band fluorine laser apparatus according to Claim 1, wherein the interval between said two electrodes is set at a predetermined length to maintain glow discharge without causing dielectric breakdown between said cathode and anode when the pressure of said laser gas is set equal to or lower than said predetermined value.

5. An ultra-narrow band fluorine laser apparatus

according to Claim 4, wherein the discharging mode for causing said glow discharge is longitudinal discharge in which discharge occurs in the same direction as the optical axis of laser light oscillated in said laser chamber.

6. An ultra-narrow band fluorine laser apparatus according to Claim 1, further comprising an oscillator including said laser chamber and an amplifier for amplifying the power of laser light oscillated by the oscillator and supplying it as an exposure light source for said exposure apparatus.

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7. An ultra-narrow band fluorine laser apparatus according to Claim 6, wherein the discharging mode of the glow discharge caused between the cathode and anode in said laser chamber is transverse discharge in which discharge occurs in a direction perpendicular to the optical axis of laser light oscillated in said laser chamber and wherein the transverse discharge decreases the discharge voltage applied between said cathode and anode to a desired voltage such that glow discharge is maintained without causing dielectric breakdown between said two electrodes.